

power of an *in vitro* generated neuron with the patch-clamp pipette attached. (g) Spike-like activity induced by step depolarization (traces on the right; vertical scale, 100 mV; horizontal scale, 500 ms) and spontaneous inward currents (traces on the left; vertical scale 100 pA; horizontal scale, 500 ms) in 5 different cells.

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**FIG. 4** is a histogram illustrating the astroglial phenotype of the attached cells *in vitro*, as assessed by GFAP-immunocytochemistry after each passage, until passage five, when approximately 90% of the cells were GFAP<sup>+</sup>.

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**FIG. 5A and B** are histograms that describe the growth characteristics over the repeated passages, expressed as "Cell doubling time" (hrs) (FIG. 5A) and "Days to confluency" (FIG. 5B), after each passage. The cells showed a high growth activity during the initial four passages, but with a significant decrease in growth rate during passages 6-8, after which the rate of division increased again to values similar to those during the initial culture period and then remained stable throughout the test, *i.e.* at least until passage 25 (seven months).

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#### DETAILED DESCRIPTION OF THE INVENTION

*GFAP<sup>+</sup> Nestin<sup>+</sup> cells.* The invention provides "NS4" cells. An NS4 cell is an undifferentiated neural cell that can be induced to proliferate using the methods of the present invention. The NS4 cell is capable of self-maintenance, such that with each cell division, at least one daughter cell will also be a NS4 cell. A NS4 cell has a glial morphology and is immunoreactive for both glial fibrillary acidic protein (GFAP) and nestin.

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Glial fibrillary acidic protein (GFAP) is an intermediate filament protein specifically expressed by astrocytes and glial cells of the central nervous system and by Schwann cells, the glial cells of the peripheral nervous system (Jessen *et al.*, 13 J. Neurocytology 923-934 (1984) and Fields *et al.*, 8 J. Neuroimmunol. 311-330 (1989)). Anti-GFAP antibodies are commercially available (*e.g.*, a rabbit monoclonal antibody raised against GFAP is available from DAKO).

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